

## **ABSTRACT OF THE DISCLOSURE**

A VCO circuit for a fractional-n PLL circuit is described for implementing a direct modulation scheme. An embodiment of the invention provides a bank of switchable capacitors used to stringently control the gain of the VCO (KVCO). The capacitors provide the stringent control necessary for direct modulation. The bank of switchable capacitors is used to coarsely tune the VCO circuit.

A linear capacitor is placed in series with the varactor to linearize the frequency/capacitance response of the varactor. The capacitor also serves to isolate a reference voltage that is used to bias the varactor diode to ensure the linear range of the varactor is within the voltage range of the VCO circuit power supply. The varactor is used for fine tuning of the VCO circuit.

For one embodiment the input voltages to the VCO are across a resistance value sufficient to dampen noise picked up through an external loop filter.